Amendments to the Claims

Please amend the claims to read as follows.

1. (Currently Amended): A method for manufacturing an optical device comprising:

moving a mask situated between a layer of optical waveguide material to be shaped and a source of etchant ions, wherein at least two areas of the optical waveguide material are exposed to variable amounts of etchant ions provided along a selected etching direction to provide an optical waveguide having an optical axis non-parallel to the selected etching direction and having a thickness that varies along the direction of the optical axis~~, thereby causing vertical thickness variations between the at least two areas~~.

2. (Original): The method of claim 1, wherein the mask has a comb shape comprising teeth.

3. (Original): The method of claim 1, wherein the mask has a comb shape and wherein the mask comprises tapered teeth.

4. (Original): The method of claim 1, wherein the mask comprises at least one slit.

5. (Original): The method of claim 1, further comprising a stationary mask.

6. (Original): A vertically tapered waveguide produced by the method of claim 1.

7. (Original): A diffraction grating produced by the method of claim 1.

8. (Original): The method of claim 1, wherein the mask moves in a linear direction with respect to the plane of the optical waveguide direction.

9. (Original): The method of claim 1, wherein the mask moves with a reciprocating motion with respect to the plane of the optical waveguide direction.

10. (Currently Amended): A method of micromachining comprising:

etching through a moving mask so that a desired sidewall shape is produced in an optical material, wherein the moving mask is a comb mask comprising teeth and the motion is a reciprocating motion along a direction perpendicular to the direction along which the teeth extend.

11. (Previously Presented): An optical device comprising:

a waveguide comprising an upper surface and a lower surface, the upper surface comprising a vertically tapered portion and a non-vertically tapered portion; and

a diffraction grating disposed on the upper surface at the non-vertically tapered portion, wherein the waveguide and the diffraction grating are made from a monolithic optical material, and wherein the monolithic optical material is over a substrate common to both the waveguide and the diffraction grating, the substrate disposed adjacent to the lower surface of the waveguide.

12-13. (Canceled).

14. (Previously Presented): A method for forming a waveguide with a vertical taper, comprising the steps of:

a) forming a waveguide;

b) disposing a movable mask above the waveguide;

c) moving the mask along the waveguide while exposing the waveguide to an ion etching process, so that a vertical taper is formed in the waveguide.

15. (Original): The method of claim 14 wherein the waveguide comprises silicon.

16. (Previously Presented): The method of claim 14 wherein the etching process is selected from the group consisting of deep reactive ion etching, plasma etching, ion beam milling, and laser-chemical etching.

17. (Original): The method of claim 14 wherein the mask is in contact with the waveguide.

18. (Original): The method of claim 14 wherein the mask is up to 250 microns above the waveguide.

19. (Original): The method of claim 14 wherein the mask is moved a distance of 50-1000 microns.

20. (Original): The method of claim 14 wherein the depth of the taper is in the range of 0-5 microns.

21. (Original): A vertically tapered waveguide made according to the method of claim 14.

22. (Previously Presented): An optical device comprising:

a waveguide comprising an upper surface and a lower surface, the upper surface comprising a taper surface that provides a vertical taper to the waveguide; and

a diffraction grating disposed on the taper surface, wherein the waveguide and the diffraction grating are made from a monolithic optical material, and wherein the monolithic optical material is over a substrate common to both the waveguide and the diffraction grating, the substrate disposed adjacent to the lower surface of the waveguide.